Claims

1-27.   (Cancelled)

28. (Previously Provided)   An image decoding method for decoding coded picture data which is derived from:

    dividing a matrix of image signal into blocks of different sizes;

    performing an orthogonal transform on the respective blocks;

    reading resultant orthogonal transform coefficients into strings of transform coefficients while arranging a single string of transform coefficients from a block larger than a block of a minimum size into shorter strings of transform coefficients each having a length equal to that of a string of transform coefficients from the minimum size block; and

    entropy-coding the respective strings of transform coefficients,
the image decoding method comprising:

    entropy-decoding the coded picture data to derive the strings of entropy-decoded transform coefficients;

    combining the shorter strings of entropy-decoded transform coefficients back into the single string of entropy-decoded transform coefficients; and

    performing an inverse orthogonal transform on the single string of entropy-decoded transform coefficients in order to reproduce the matrix of image signal;

    wherein the coded picture data comprises entropy-coded data representing strings of sixteen (16) transform coefficients obtained by interleaving, from a lower frequency coefficient, sixty four (64) transform coefficients of an orthogonally transformed 8x8 block to produce four (4) strings of sixteen (16) transform coefficients,

    wherein entropy-decoding the coded picture data comprises entropy-decoding the entropy-coded data of the respective strings of sixteen (16) transform coefficients,

    wherein combining the shorter strings of entropy-decoded transform coefficients comprises de-interleaving, from a lower frequency coefficient, sixty four (64) transform coefficients from the four (4) strings of sixteen (16) transform coefficients to reconstruct the single string consisting of the sixty four (64) transform coefficients of the orthogonally transformed 8x8 block, and

wherein performing an inverse orthogonal transform comprises performing an inverse orthogonal transform on the sixty four (64) transform coefficients of the orthogonally transformed 8x8 block.

29. (Previously Provided)   An image decoding apparatus for decoding coded picture data which is derived from:

dividing a matrix of image signal into blocks of different sizes;

performing an orthogonal transform on the respective blocks;

reading resultant orthogonal transform coefficients into strings of transform coefficients while arranging a single string of transform coefficients from a block larger than a block of a minimum size into shorter strings of transform coefficients each having a length equal to that of a string of transform coefficients from the minimum size block; and

entropy-coding the respective strings of transform coefficients,
the image decoding apparatus comprising:

an entropy decoder configured to entropy-decode the coded picture data to derive the strings of entropy-decoded transform coefficients;

a string reconstructor configured to combine the shorter strings of entropy-decoded transform coefficients back into the single string of entropy-decoded transform coefficients; and

an inverse orthogonal transformer configured to perform an inverse orthogonal transform on the single string of entropy-decoded transform coefficients in order to reproduce the string of image signal;

wherein the coded picture data comprises entropy-coded data representing strings of sixteen (16) transform coefficients obtained by interleaving, from a lower frequency coefficient, sixty four (64) transform coefficients of an orthogonally transformed 8x8 block to produce four (4) strings of sixteen (16) transform coefficients,

wherein the entropy decoder entropy-decodes the entropy coded data of the respective strings of sixteen (16) transform coefficients,

wherein the string reconstructor de-interleaves, from a lower frequency coefficient, sixty four (64) transform coefficients from the four (4) strings of sixteen (16)

transform coefficients to reconstruct the single string consisting of the sixty four (64) transform coefficients of the orthogonally transformed 8x8 block, and

wherein the inverse orthogonal transformer performs an inverse orthogonal transform on the sixty four (64) transform coefficients of the orthogonally transformed 8x8 block.

30. (Previously Presented)   A non-transitory storage medium which stores an image decoding program executable on a computer which causes the computer to decoding coded picture data which is derived from:

dividing a matrix of image signal into blocks of different sizes;

performing an orthogonal transform on the respective blocks;

reading resultant orthogonal transform coefficients into strings of transform coefficients while arranging a single string of transform coefficients from a block larger than a block of a minimum size into shorter strings of transform coefficients each having a length equal to that of a string of transform coefficients from the minimum size block; and

entropy coding the respective strings of transform coefficients,
the program further causing the computer to:

entropy decoding the coded picture data to derive the strings of entropy decoded transform coefficients;

combining the shorter strings of transform coefficients back into the single string of transform coefficients; and

performing an inverse orthogonal transform on the single string of entropy decoded transform coefficients in order to reproduce the string of image signal;

wherein the coded picture data comprises entropy coded data representing strings of sixteen (16) transform coefficients obtained by interleaving, from a lower frequency coefficient, sixty four (64) transform coefficients of an orthogonally transformed 8x8 block to produce four (4) strings of sixteen (16) transform coefficients,

wherein entropy decoding the coded picture data comprises entropy decoding the entropy coded data of the respective strings of sixteen (16) transform coefficients,

wherein combining the shorter strings of entropy decoded transform coefficients comprises de-interleaving, from a lower frequency coefficient, sixty four transform

coefficients from the four (4) strings of sixteen (16) transform coefficients to reconstruct the single string consisting of the sixty four (64) transform coefficients of the orthogonally transformed 8x8 block, and

wherein performing an inverse orthogonal transform comprises performing an inverse orthogonal transform on the sixty four (64) transform coefficients of the orthogonally transformed 8x8 block.

31. (Previously Provided)   An image decoding method for decoding coded picture data, comprising:

computer-executable steps performed by a processor of a computer system to implement:

entropy-decoding the coded picture data to derive four transform coefficient strings each comprising entropy-decoded sixteen (16) transform coefficients;

combining the four strings into an 8x8 block of entropy-decoded sixty four (64) transform coefficients by de-interleaving the four strings in such a manner as to select a lower frequency transform coefficient alternately from the four strings and arrange it in the 8x8 block in an order of a low frequency to a high frequency; and

performing an inverse orthogonal transform on the 8x8 block of the entropy-decoded sixty four (64) transform coefficients.

32. (Previously Provided)   An image decoding apparatus for decoding coded picture, comprising:

a processor of a computer system and a memory that stores programs executed by the processor to:

entropy-decode the coded picture data to derive four transform coefficient strings each comprising entropy-decoded sixteen (16) transform coefficients;

combine the four strings into an 8x8 block of entropy-decoded sixty four (64) transform coefficients by de-interleaving the four string in such a manner as to select a lower frequency transform coefficient alternately from the four strings arrange it in the 8x8 block in an order of a low frequency to a high frequency; and

perform an inverse orthogonal transform on the 8x8 block of the entropy-decoded sixty four (64) transform coefficients.

33. (Currently Amended)   A non-transitory storage medium which stores image ~~encoding~~ decoding programs executable on a processor of a computer system which causes the processor to implement:

entropy decoding the coded picture data to derive four transform coefficient strings each comprising entropy decoded sixteen (16) transform coefficients;

combining the four strings into an 8x8 block of entropy-decoded sixty four (64) transform coefficients by de-interleaving the four strings in such a manner as to select a lower frequency transform coefficient alternately from the four strings and arrange it in the 8x8 block in an order of a low frequency to a high frequency; and

performing an inverse orthogonal transform on the 8x8 block of the entropy decoded sixty four (64) transform coefficients.

34-36. (Cancelled)